SmartLink™ Wireless

User Manual

Software version 2.1X

Welch Allyn®

Advancing Frontline Care™

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1 Overview

The Welch Allyn SmartLink Wireless system consists of four software components:

- SmartLink Wireless Monitoring Station (required)
- eSync Application (required)
- SmartLink Wireless Gateway Service (optional)
- SmartLink Wireless Gateway Client (optional)

The SmartLink Wireless Monitoring Station runs on a dedicated computer typically located within a hospital location accessible to medical personnel (e.g. the Emergency Department). The primary functions of the system are to receive 12-Lead ECG data transmitted wirelessly from one or more Welch Allyn PIC 50 units in the field; to display the 12-Lead data in a standard format; and to route the 12-Lead data to one or more intended recipients.

The eSync application runs on Pocket PC-based PDAs and handheld devices. eSync is used to download 12-Lead ECG data from PIC 50 devices and to transmit the 12-Lead data wirelessly to the hospital receiving station via a cellular network.

The SmartLink Wireless Gateway Service typically runs on an existing server within a hospital's computer center. The primary function of this software is to receive 12-Lead transmissions from the eSync application via the internet and forward the transmissions to the monitoring station.

While the monitoring station is capable of receiving transmissions directly, the gateway can be used to prevent the monitoring station from being exposed directly to the internet. The gateway can receive transmissions on a well known address and send them to an internal hospital LAN address. This also allows the monitoring station to be part of the Electronic Protected Health Information (ePHI) zone.

The SmartLink Wireless Gateway Client can be run on any workstation that has network access to the gateway service. The client connects to the service and enables administrative personnel to monitor the current activity of the gateway service. This can be useful for configuring the system and troubleshooting communications problems that may arise.

The SmartLink Wireless software provides a real-time list of transmissions received. This list is referred to as the Transmission Event Log. Each entry of the log displays information about the transmission such as the sender, transmission status, date and time of the transmission, and the patient associated with the transmission.

The 12-Lead data associated with a transmission in the Transmission Event Log can be viewed by double clicking the log entry. The SmartLink Wireless software will display the 12-Lead snapshot on the screen in a 4x3 waveform format. Information such as the patient data and analysis results (if available) are displayed on the left side of the screen.

The main features of the SmartLink Wireless software include:

- A Transmission Event Log to display real-time incoming transmissions and provide details about each transmission.
- Automatic notification to selected personnel via email, text messaging and pager when a new transmission has been received.
- A snapshot view of 12-Lead data in a convenient graphical format together with patient and analysis information.
- The ability to print the 12-Lead data in graphical format.
- The ability to manually forward the 12-Lead data to selected personnel.
- Automatic archival of each transmission received.
- The ability to retrieve, review and print archived transmissions even after deleting them from the Transmission Event Log.

System requirements

Monitoring Station System requirements

Note This system should be a dedicated system for the Monitoring station.

Minimum requirements

- Windows® NT-class monitoring station computer (Windows® 2000, Windows® XP, Windows® Server 2003)
- x86 processor
- 50 MB of available hard disk space
- Video card and monitor running at 1024x768
- Mouse (or similar pointing device)
- COM 1 serial port availability[a]
- Network/Internet connection[b]
- Microsoft® ActiveSync®

Recommended system configuration

- Windows® NT-class receiving station computer (Windows® 2000, Windows® XP, Windows® Server 2003)
- Intel® Pentium® 4 1.0 GHz processor
- 512 MB of RAM
- 500 MB+ of available hard disk space (for 12-Lead data storage)
- Video card and monitor running at 1024x768
- Mouse (or similar pointing device)
- Printer connection, local parallel port or network
- COM 1 serial port availability[a]
- Internet Connection[b]
- Microsoft® ActiveSync®

Gateway System requirements

Note This system may be an existing server and does not need to be a dedicated system.

Minimum requirements

- Windows ® NT-class computer (Windows® 2000 SP3, Windows ® XP SP2, Windows ® Server 2003)
- x86 processor
- 5 MB of available hard disk space
- Video card and monitor
- Mouse (or similar pointing device)
- Network/Internet connection
- Microsoft® .NET™ 2.0.50727 Framework

a. Only needed if an external modem will be used for paging.
b. Depending on your system configuration, the SmartLink Gateway Monitoring Station and Gateway will need a network and/or Internet connection to receive 12-Lead data and to send email and text message notifications.

Recommended system configuration

- Windows® NT-class computer (Windows® 2000 SP3, Windows® XP SP2, Windows® Server 2003)
- Intel® Pentium® 4 1.0 GHz processor
- 512 MB of RAM
- 5 MB of available hard disk space
- Video card and monitor
- Mouse (or similar pointing device)
- Internet connection
- Microsoft .NET 2.0.50727 Framework

Gateway Client System requirements

Note The gateway client may be installed on any existing computer which meets the minimum requirements.It does not need to be a dedicated system.

Minimum requirements

- Windows® NT-class computer (Windows® 2000 SP3, Windows® XP SP2, Windows® Server 2003)
- x86 processor
- 1 MB of available hard disk space
- Video card and monitor running at 1024x768
- Mouse (or similar pointing device)
- Network connection with access to the gateway service
- Microsoft® .NET® 2.0.50727 Framework

Minimum eSync PDA requirements for transmitting 12-leads

- ARM® Processor with Windows® CE 4.2, 4.21, 5.0 for Pocket PC 2000, 2002, 2003
- Display size of 240x320
- Available serial port
- Vendor-specific serial data cable
- Internet connection
- Microsoft® ActiveSync®

Minimum (Physician) PDA requirements for receiving 12-leads

- Display size of 240x320
- Acrobat® Reader® for Pocket PC
- Standard e-mail program, such as Pocket Outlook, to receive 12-lead e-mail attachments
- Internet connection

2 Installation and upgrade

The Welch Allyn SmartLink Wireless CD may be used to install or upgrade any or all of the SmartLink Wireless components: SmartLink Wireless Monitoring Station, SmartLink Wireless Gateway Service, SmartLink Wireless Gateway Client and the eSync PDA application. The following sections describe the installation of these components in detail.

Configuration options

SmartLink Wireless components can be configured in several ways depending on the network configuration and available computers. The possible configurations are:

- Monitoring station with no gateway
- Monitoring station and gateway on separate computers
- Monitoring station and gateway on a single computer

Note For the latter two configurations, the gateway client may then be installed on any system that has network access to the gateway. See "Monitoring Station configuration options" on page 16 for more information.

Connecting a PDA to the SmartLink Wireless Monitoring Station

When installing the SmartLink Wireless Monitoring Station on a system, it is recommended to connect a PDA for installation of the eSync software. While it is possible to install ActiveSync and connect a PDA for installation after the SmartLink Wireless installation, it is recommended to complete this step prior to SmartLink Wireless installation.

Note Microsoft ActiveSync should be installed on the PC and handheld computer prior to installing the SmartLink Wireless software. If ActiveSync is not installed on the system, it can be downloaded from www.microsoft.com/windowsmobile

To configure the ActiveSync application on the PC

1. Double click the ActiveSync icon.
2. Select the **File** menu item then select **Connection Settings**. This will bring up the Connection Settings dialog box.
3. Connect the handheld to the PC using a serial cable via a COM port, or via a USB port.

   To use a serial cable and COM port:

   Select the check box for **Allow serial cable or infrared connection to this COM port**.

   Click on the combo box below the check box to select an available COM port.

To use USB:

Click on the check box for **Allow USB connection with this desktop computer**.

4. Status Icon: Select **Show status icon in the TaskBar**.

   Click **OK**.

To connect the handheld to the PC

Note A cable or docking cradle is needed to connect the handheld to the PC. The cable or docking cradle must be supplied by the manufacturer of the handheld or its approved vendor.

1. Connect the handheld using the cable or docking cradle to the USB port, or to the COM port (selected in the previous step while configuring the ActiveSync application) of your PC. This should automatically connect the PC to the handheld via the ActiveSync application. (Once connected, the round-shaped ActiveSync icon both on the PC and the handheld should turn green in color).
2. If the connection is not made automatically:
   a. Double click the ActiveSync icon.
   b. On the ActiveSync application, select **File**. Select **Get Connected**.
   c. If still not connected to the PDA, reset the PDA following the manufacturer's instructions for a reset. Typically this is done by inserting the stylus in a small hole at the bottom of the PDA. After the reset, repeat Step 1 above.
3. Depending on the version of ActiveSync, a "New Partnership" dialog screen may appear. If so, select **Guest Partnership** and press **Next**.

SmartLink Wireless installation

Upgrading from a previous version

The SmartLink Wireless installation disk can be used to upgrade the SmartLink Wireless Monitoring Station (previously known as the SmartLink Wireless Server or Receiving Station) from version 2.0 and higher. It is not necessary to uninstall the previous version. A backup copy of the system and the SmartLink Wireless installation directory should be made before proceeding with an upgrade. When the backup is complete, follow the instructions below and use the same folder as the previous installation for the upgrade of the Monitoring Station. This will save the current settings as well as the current transaction log.

Upgrading to the current version of the Monitoring Station will enable it to be used in any of the configurations described in the previous sections.

Installing SmartLink Wireless

To start the installation and select components

1. Insert the Welch Allyn SmartLink Wireless CD into the CD drive of the PC.
2. If the installation does not start automatically, start the 'Setup' application by double clicking on the CD setup icon. This will launch the Setup wizard. Follow the prompts on the Setup wizard, Setup wizard will display the following pages or screens:
   a. *Welcome*. click **Next**.
   b. *License Agreement*. Read the licensing agreement and if you agree, select the radio button for 'I accept the agreement.' Click **Next**.
   c. *Information*. Read the pre-install information and click **Next**.
   d. *User Information*. Enter the User Name and Organization and click **Next**.
   e. *Destination Directory*. Click **Next** to install to the default directory or select a different directory and click **Next**. The default directory is "C:\Program Files\Welch Allyn SmartLink Wireless."
   f. *Select Components*. Select the components to be installed on the computer.

      If Gateway Service or Client is selected, Microsoft .NET 2.0 must be installed on the system. If .NET is not already installed, select it. If you are not sure, see "Microsoft .NET 2.0 Framework" on page 8 for more information.

      If "SmartLink Wireless Monitoring Station" is selected, the computer will also be used to install eSync on the PDAs. See "SmartLink Wireless Monitoring Station installation" on page 8 for more information.

      If no components are selected, the installation will proceed to copy just the user documentation and license agreement.
   g. *Start Menu Folder*. Select the shortcut folder and click **Next**. The default folder is "Welch Allyn SmartLink Wireless."
   h. *Ready to Install*. Review the installation options and click **Install**.

      If installing the SmartLink Wireless Monitoring Station and Microsoft Active Sync has not been installed or not properly installed on the PC, the application will

display a failure message. The message will say Microsoft ActiveSync is not found and inform the user that only the SmartLink Wireless software will be installed to the PC.

Note If necessary, download Microsoft ActiveSync from www.microsoft.com/windowsmobile

i. The installation will begin and display a progress bar as the SmartLink Wireless software is copied to your system. Proceed to the following sections, depending on the component selection(s) made above.

Microsoft .NET 2.0 Framework

If not already on the system, Microsoft .NET 2.0 Framework will need to be installed to install and run the Gateway Service and Client. For more information on the system requirements for .Net 2.0, refer to the Microsoft Download Center.

To install .NET 2.0

1. If .NET is already installed on the system, you will be given the option to Repair or Uninstall .NET. Press **Cancel** to cancel the .NET installation, and then confirm by pressing **Yes** and **Finish**. Proceed with the SmartLink Wireless installation.
2. If .NET is not already installed on your system, the .NET setup wizard will guide you through the .NET installation. Follow the prompts and accept the Microsoft end user license agreement when appropriate. Once the .NET installation is complete, press **Finish**. Continue with the SmartLink Wireless installation.

SmartLink Wireless Monitoring Station installation

Use the Server Configuration dialog to configure SmartLink Wireless monitoring stations for use with eSync. The settings may be conveniently downloaded to handheld computers. By storing the settings on PC files, the settings may be downloaded to multiple handheld computers, eliminating the need to enter them individually on each handheld.

To configure use with eSync

1. Create the Server list:
   a. Enter a name in the Server Name edit box. The name must be a text string up to 64 characters in length. The field may not be blank.
   b. Enter an address in the Server Address edit box. The address must be a text string up to 64 characters in length. The address may be in the dotted number format (e.g., 207.127.96.194) or a text string to denote a hostname (e.g. wireless.welchallyn.com). The field may not be blank.
   c. Enter an available port number in the Control Port edit box. The control port must be a number between 1 and 65,535.The field may not be blank. The control port has the default value 2098.
   d. Enter an available port number in the Data Port edit box. The data port must be a number between 1 and 65,535.The field may not be blank. The data port has the default value 2099.
   e. Press **Add** to add the Server to the list.

f. Repeat the process to add up to 32 servers to the list.

g. Press **OK**.

ETA/Altitude Entry: You may check the box to turn on the ETA/Altitude feature. When this option is enabled, the PIC50 users transmitting a 12-Lead will be required to enter their ETA and Altitude on the PDA each time a 12-lead snapshot is transmitted.

2. When prompted to install eSync on the handheld, press **Yes** if ready to install on one or more handlhelds.

   If **No** is selected, a message is displayed informing that Welch Allyn eSync may be installed later using the shortcut, Upgrade or Install Welch Allyn eSync. In this case, only SmartLink Wireless is installed. Skip the following steps and proceed to next section relevant to your installation configuration.

3. A message box is displayed to prompt the user to connect the handheld to the PC using ActiveSync. Press **OK** if the handheld is already connected, or connect the handheld to the PC and then press **OK**.

   Pending Application Install. If proceeding without connecting the handheld to the PC, the application will display a message that the SmartLink Wireless eSync application will be downloaded to the handheld the next time the handheld is connected to the PC. Only the PC portion of the SmartLink Wireless system (the hospital monitoring station) is installed.

   The next time the handheld is connected to the PC, a message is automatically displayed asking to install SmartLink Wireless eSync application. Press **OK** to install SmartLink Wireless eSync application on the handheld.

4. *Add/Remove Programs.* This option for Microsoft ActiveSync is automatically displayed.

5. *Retrieving Device Data*. This message box is displayed.

6. *Installing Applications*. Press **Yes** to install to the default directory on the handheld. Press **No** to display a combo box. Select the media location to install.

7. *Application Downloading Complete*. Check the handheld screen and press **OK**.

   The handheld will not require any intervention for a typical install. If the program is already installed, the handheld will wait for user confirmation. Also if the handheld has Windows Mobile 2003 or later, the message "The program you have installed, may not display properly because it was designed for a previous version of Windows Mobile software" may be displayed. There is no known problem for Windows Mobile 2003. This alert may be dismissed. If there is a problem with your version of Windows Mobile, contact Welch Allyn technical support.

8. The application will prompt to install the eSync application on another handheld. If installation to another handheld is needed, disconnect the current handheld. Connect the new handheld to the PC. Press **Yes**.

   If not, select **No** and the Completing screen of the Setup wizard will be displayed.

SmartLink Wireless Gateway installation

To install SmartLink Wireless Gateway

Note If this is the initial installation of SmartLink Wireless Gateway, skip ahead to Step 2.

1. If upgrading or re-installing the SmartLink Wireless Gateway after the initial installation, it may be necessary to stop the service if it is running. This must be done prior to proceeding with the gateway installation. Administrative privileges are required to proceed. Access the services tool using "Start|Administrative Tools|Services." Alternatively, "Start|Run…" can be used by executing the command "services.msc /s." Find and select "SmartLink Gateway Service" and stop it, then proceed with the installation.When the installation begins, the setup procedure will uninstall any previous version of the service. The main setup screen will display a message "Removing previous version of SmartLink Wireless Gateway Service."
2. *SmartLink Wireless Gateway Service Login Configuration.* Use this dialog to specify the account under which the service will automatically login on startup of the system, or anytime the service is restarted.
   a. *Select Login Account*. First select the login account from one of the four options:
      - Local Service
      - Network Service
      - Local System
      - This Account

      The first three choices are Windows built-in system accounts will not require a password. If the fourth option is selected, a valid account name and password must be entered as specified below.

Note The installation program will not verify the account information. If it is entered improperly, the installation of the service may fail, or the service may not be able to start. If this occurs, you can either restart the installation, or manually configure the username an password of the service from the Service control panel or Computer Management application.

   b. *Account Name*. Specify the account name in the format "{domain name}\{account name}." Even if specifying a account on the local computer, the domain name must be specified. In this case, either use the computer name or simply " . "(e.g. ".\myaccount").
   c. *Password*. Enter and confirm the password for the specified account.
3. After completing all the entries, press **OK**.
4. *Service Installation*. The main setup screen should display the message "Installing SmartLink Wireless Gateway Service with automatic startup." When this is completed, the installation will proceed automatically to the next step.
5. *SmartLink Wireless Gateway Service Configuration*. Use this dialog to configure the SmartLink Wireless Gateway.
6. Enter data for each of the appropriate fields as follows:
   a. *Gateway Service IP Address*. Enter the IP address that will be used for listening for connections from eSync on the PDAs. This will be the address that will receive

connections from the public IP. If a firewall or network gateway with NAT is present, this will be an internal address that has been set up for port forwarding on the appropriate ports. If the computer has multiple network adapters, be certain to select the IP address for the adapter that will receive these forwarded connections.

b. *Gateway Control Port*. This is the port the gateway will listen for control connections from eSync. If NAT is used, this port must be forwarded from the network access point to the Gateway Service Address.

c. *Gateway Data Port*. This is the port the gateway will listen for data connections from eSync. If NAT is used, this port must be forwarded from the network access point to the Gateway Service Address.

d. *Monitoring Station IP Address*. This is the IP address of the SmartLink Wireless Monitoring Station computer. The Gateway will use this address to connect to the Monitoring Station.

e. *Monitoring Station Control Port*. This is the port on which the SmartLink Wireless Monitoring Station will be configured to listen for control connections. The Gateway will use this port to connect to the Monitoring Station.

f. *Monitoring Station Data Port*. This is the port the SmartLink Wireless Monitoring Station will be configured to listen for data connections. The Gateway will use this port to connect to the Monitoring Station.

g. *Client Connection Port*. This is the port the Gateway will listen for client connections.The Gateway Client is used to monitor the activity of the Gateway.

h. *Client Password*. Specify and confirm a password that will be used when accessing the Gateway from a Client.While it is possible to specify an empty password, this is not recommended.

i. *Logging Level*. Select the logging level. Log entries are written to the Windows Event Log. Note that "eSync/SLW Communication" entries only take one log entry for each full communication.

7. After completing all the entries, press **OK**.

8. *Service Startup*. There should be a message saying the SmartLink Wireless Gateway Service has been started. Press **OK**.

SmartLink Wireless Gateway Client installation

No additional steps are required for the SmartLink Wireless Gateway Client.When using the client, it is possible to specify the address, port and password for connection to the Gateway.

Completing the installation

At the completing prompt, press **Finish**. This completes the installation and dismisses Setup wizard from your PC.

eSync Sender List

After the SmartLink Wireless software has been installed and started for the first time, the first thing that should be done is to set up the Sender List on the hospital monitoring station. The Sender List is a cross-reference list between PIC50 serial numbers and

sender names.T he sender name assigned is the name that shows up in the Transmission Event Log's Sender column.

To set up the Sender List

1. Select the Tools menu item from the SmartLink Wireless software menu. Select the Options submenu item. From the SmartLink Wireless Configuration dialog, select the Sender List tab.
2. Enter a PIC50 serial number in the PIC Serial Number column and a name to associate with the PIC50 in the Sender Name column.
3. Repeat the process for all the PIC50s that will transmit to the SmartLink Wireless software.

Note Transmissions from any PIC50 that is not entered in the Sender List will display the PIC50 serial number in the Sender column of the Transmission Event Log.

Update or install Welch Allyn eSync

The "update or install" shortcut is installed during the installation of the Welch Allyn SmartLink Wireless and has two main uses:

1. Install eSync application on handhelds and
2. Update existing copies of the eSync application on handhelds.

   The user may conveniently use this option to update Server Configuration on handhelds that already have the eSync application installed on them. Upon updating Servers or adding to the list of Servers this feature may be used to download the list of Servers to all handhelds.

To update or install eSync

1. From the Start menu select the 'Welch Allyn' | 'Update or Install Welch Allyn eSync' shortcut to start the Setup wizard to update or install the eSync application. Follow the prompts on the Setup wizard, Setup wizard will display the following pages or screens:
2. *Welcome*. Click **Next**.
3. *Information*. Connect the handheld to your PC (see"To connect the handheld to the PC" on page 6 for more details). Click **Next**.
4. *Ready to Install*. Click **Install**.
5. *Server Configuration*. See "SmartLink Wireless Monitoring Station installation" on page 8 for details.
6. At the prompt to install eSync on the handheld, press **Yes**.

   If **No** is selected, a message is displayed to inform that Welch Allyn eSync may be installed later using the shortcut, Upgrade or Install Welch Allyn eSync
7. A message box is displayed to prompt the user to connect the handheld to the PC using ActiveSync. Press **OK** if the handheld is already connected, or connect the handheld to the PC and then press **OK**.

8. *Add/Remove Programs.* This option for Microsoft ActiveSync is automatically displayed.
9. *Retrieving Device Data*. The message box is displayed.
10. *Applications Already Installed.* If updating an existing eSync application on the handheld, this message box is displayed. A prompt to reinstall/upgrade the application is displayed. Press **Yes**.
11. *Installing Applications*. Press **Yes** to install to the default directory on the handheld. Press **No** to display a combo box. Select the media location.
12. *Application Downloading Complete*. Check the handheld screen and press **OK**.

    The handheld will not require any user intervention for a typical install. If the program is already installed, the handheld will wait for user confirmation. Also if the handheld has Windows Mobile 2003 or later, the message "The program you have installed, may not display properly because it was designed for a previous version of Windows Mobile software" may be displayed. There is no known problem for Windows Mobile 2003. This alert may be dismissed. If there is a problem with your version of Windows Mobile, contact Welch Allyn technical support.

    This completes the install/upgrade on the current handheld.
13. The application will prompt to install the eSync application on another handheld. If installation to another handheld is needed, disconnect the current handheld. Connect the new handheld to your PC.Press **Yes**.

    If not, select **No** and the Completing screen of the Setup wizard will be displayed.
14. *Completing*. Press **Finish**. This completes the installation/upgrade to handhelds and dismisses Setup wizard from your PC.

Removing SmartLink Wireless

Note If .NET was installed as part of the SmartLink Wireless installation, it will not be removed using this procedure. To remove .NET, it will need to be necessary to run Add/Remove Programs and remove it separately.

To uninstall Welch Allyn SmartLink Wireless

1. Bring up the PC's Add/Remove Programs.
2. Select 'Welch Allyn SmartLink Wireless 2.10.' Press **Change/Remove**.
3. A prompt is displayed to confirm the removal. Press **Yes**.
4. A message is displayed to inform the user that any installed SmartLink Wireless programs were successfully uninstalled. Press **OK**.

Removing the eSync application from PDAs

To uninstall the eSync application from the handheld

1. Bring up Microsoft ActiveSync on the PC by double clicking the ActiveSync icon.
2. On ActiveSync, press **Tools** then press the **Add/Remove Programs** sub-menu item. This will bring up ActiveSync's Add/Remove Programs dialog.

3. Clear the check box for Welch Allyn eSync on the Add/Remove Programs dialog.
4. Press **Remove** on the Add/Remove Programs dialog.
5. The Remove Application prompt is displayed. Press **OK**.

To remove eSync from a PDA without a PC connection

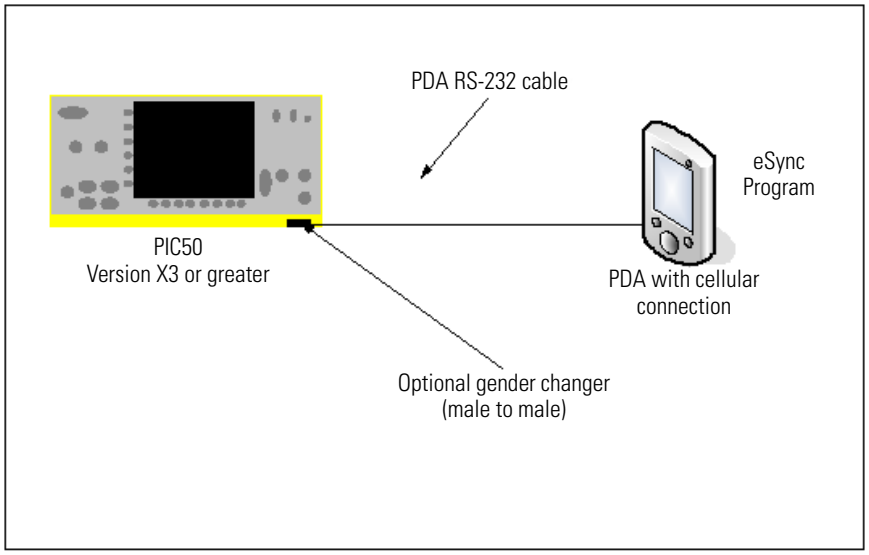
1. On the PDA, press **Start|Settings**
2. Select the System tab
3. Select Remove Programs
4. Select "Welch Allyn eSync" and press **Remove**
5. On the confirmation dialog press **Yes**

3 Options and setup

eSync Sending Station

Multiple Welch Allyn PIC50 devices will be sending 12-lead data to the monitoring station. Each PIC50 must have an associated PDA handheld computer for transmission.

Figure 1: PIC50 eSync Transmission Setup



As seen in "Figure 1: PIC50 eSync Transmission Setup", an eSync installation requires a Welch Allyn PIC50 to be connected to an approved handheld computer using the serial cable supplied by the handheld manufacturer. See "Minimum eSync PDA requirements for transmitting 12-leads" on page 4 for approved handheld computers and auxiliaries. Note that some handheld computers/auxiliaries may require a RS232 male-to-male gender changer to connect to the PIC50. As explained in section 3, the eSync application is loaded onto the handheld computer during the installation process.

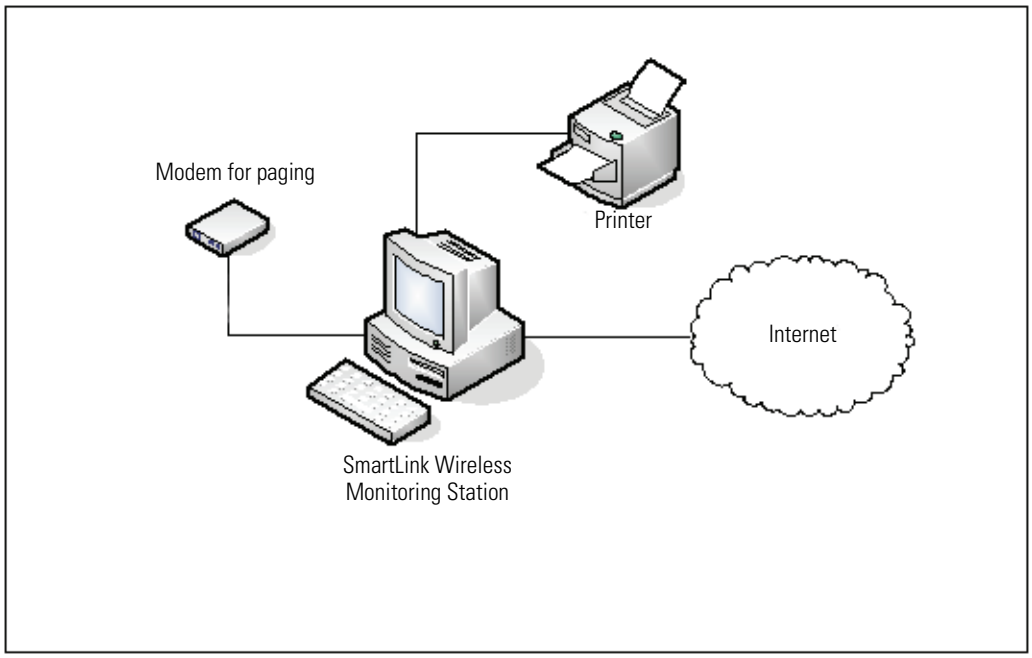
Monitoring Station configuration options

As mentioned in "Configuration options" on page 5, there are various options for configuring the SmartLink Wireless components which will receive 12-lead transmissions. This section describes the possible configurations.

Monitoring Station without Gateway

The SmartLink Wireless Monitoring Station may be installed and run without the use of the SmartLink Wireless Gateway (see "Figure 2: Monitor station without Gateway"). This is the typical installation configuration prior to version 2.10 of the system. In this configuration the system will be a dedicated computer typically located in the ED on an isolated network such as a dedicated high speed internet connection or in the DMZ.

Figure 2: Monitor station without Gateway



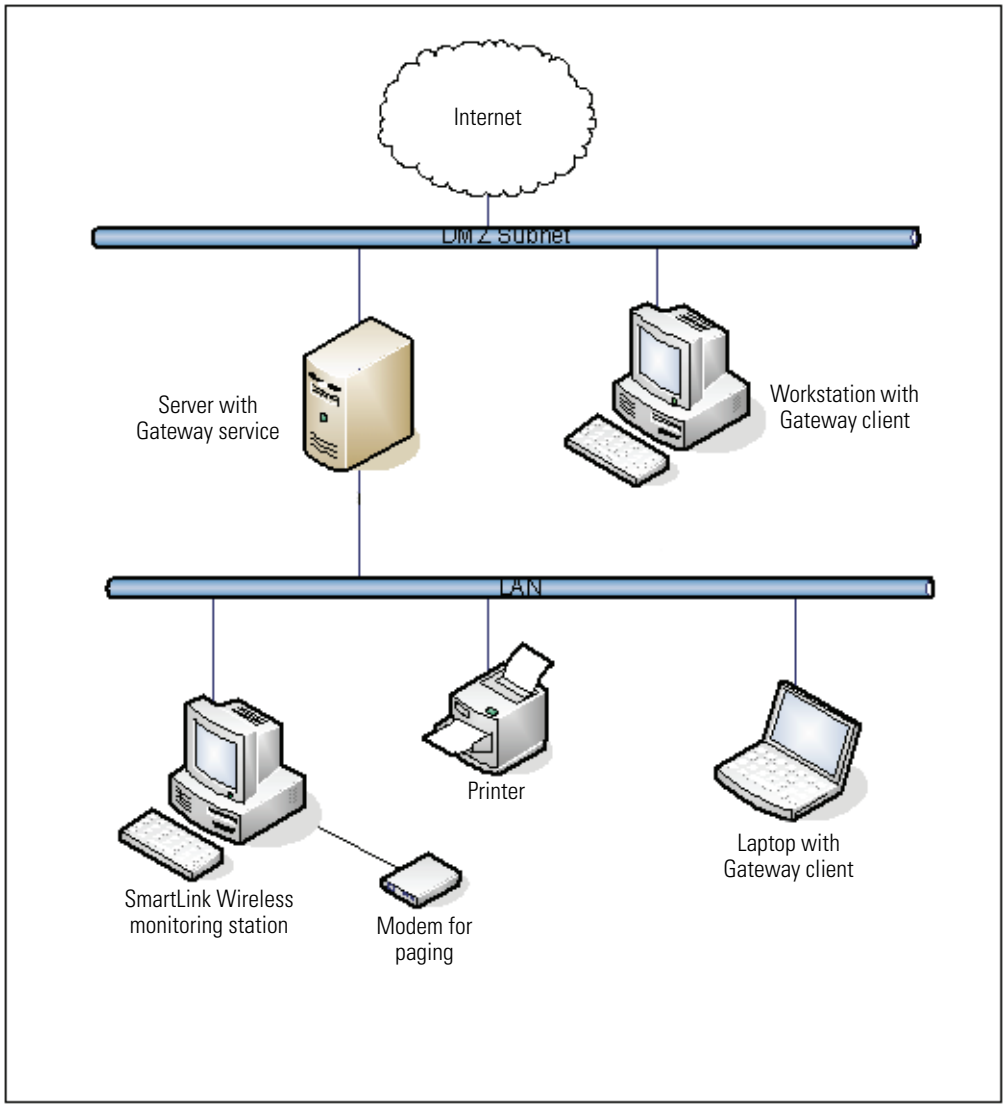
Both the SmartLink Wireless Monitoring Station software and the eSync application are connected to the Internet. The PC running the monitoring station software requires a fixed IP address and two port assignments. This fixed IP address must be accessible to eSync on PDAs as a public address on the internet or through a VPN. If network address translation (NAT) is used the address may be assigned to a router rather than directly to the monitoring station. This is the same IP address that is then entered in the Server Address field when adding the Server to the eSync application's Server list (see "SmartLink Wireless Monitoring Station installation" on page 8). When installing the SmartLink Wireless software, ensure that the IP address and ports are not blocked by any firewall. Contact your Network Administrator concerning this subject.

In this configuration, the gateway and gateway client will not be installed.

Monitoring Station and Gateway on separate computers

In this configuration, the Gateway is installed on a computer which is typically located in the network's DMZ. It may be a dedicated system, but this is not required. More likely it will be installed on an existing server. The Gateway will run as a windows service.

Figure 3: Monitoring station and Gateway on separate computers



To receive 12-lead data from the eSync PDAs, the gateway requires a fixed IP address and two port assignments. This fixed IP address must be accessible to eSync on PDAs as a public address on the internet or through a VPN. If network address translation (NAT) is used the address may be assigned to a router rather than directly to the gateway. This is the same IP address that is then entered in the Server Address field when adding the Server to the eSync application's Server list (see "SmartLink Wireless Monitoring Station installation" on page 8). When installing the SmartLink Wireless software, ensure that the IP address and ports are not blocked by any firewall. Contact your Network Administrator concerning this subject.

The monitoring station will be installed on a system which may be on the local intranet in the hospital's Protected Health Information (PHI) zone. This system will be a dedicated

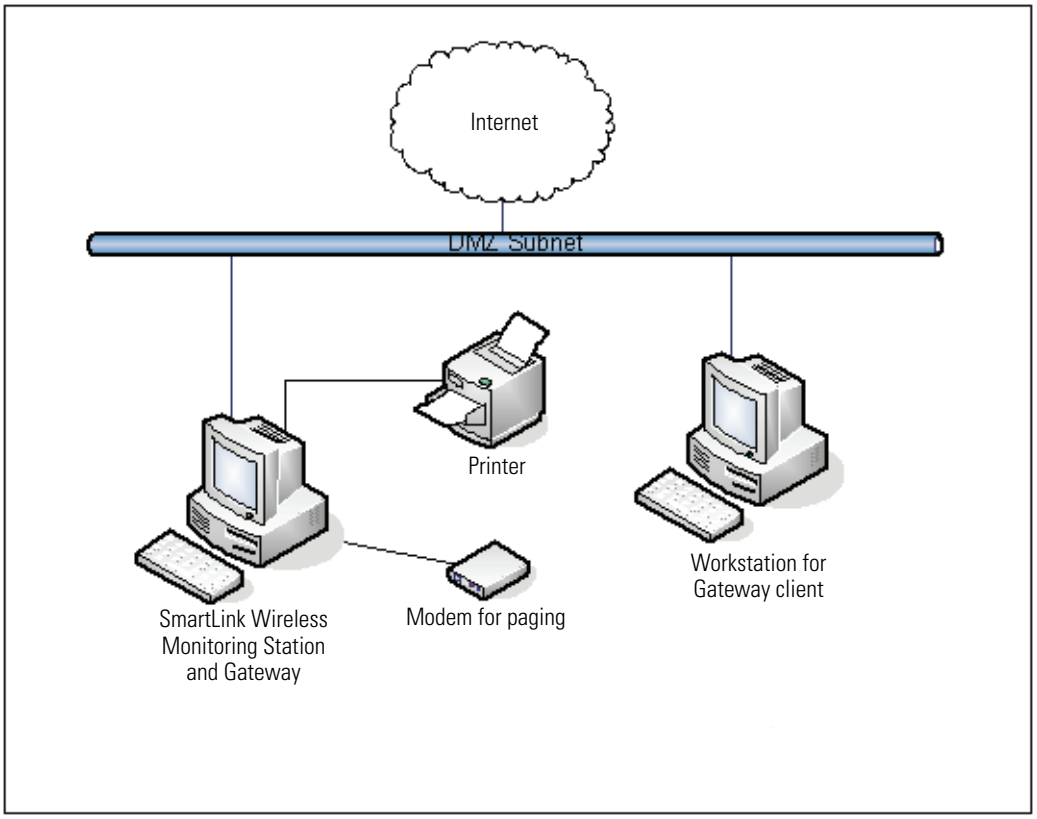
computer typically located in the ED. It will listen on two internal ports for connections from the Gateway.

The Gateway Client may be installed on multiple computers such as the Gateway server and any other computers on the network that have access to the Gateway server.

Monitoring Station and Gateway on a single computer

While this will not be a typical installation, it is possible to install the Monitoring Station and Gateway on the same computer. This offers no advantage for network isolation, but it does enable the Gateway Client to be used to monitor network transmissions.

Figure 4: Monitoring station and Gateway on a single computer



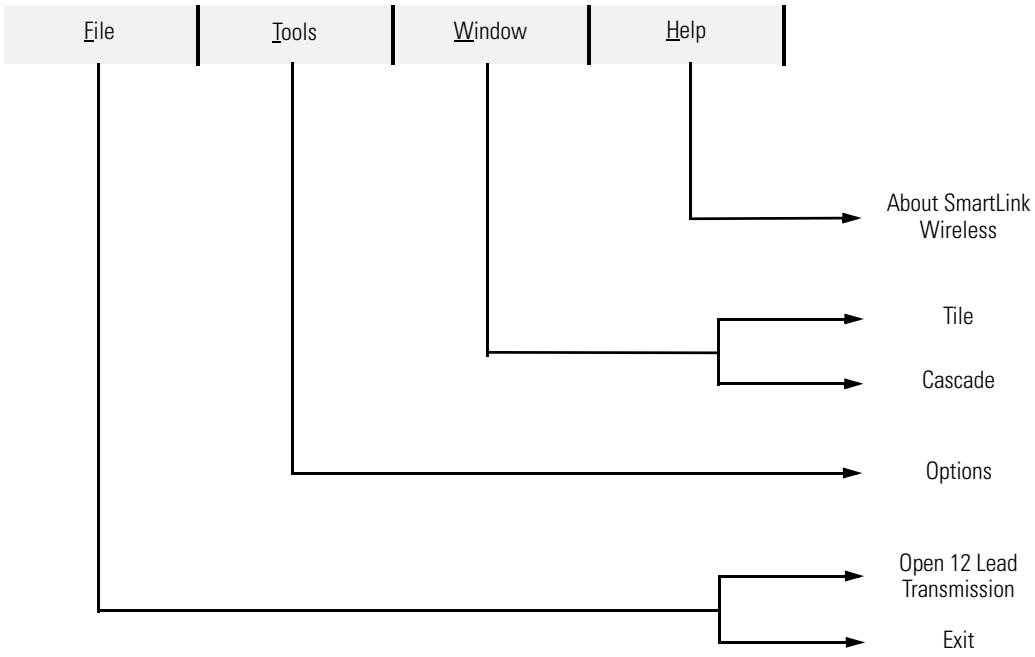
In this configuration, the system will be a dedicated computer typically located in the ED on an isolated network such as a dedicated high speed internet connection or in the DMZ. The Gateway will run as a windows service. To receive 12-lead data from the PDAs the gateway requires a fixed IP address and two port assignments. This fixed IP address must be accessible to eSync on PDAs as a public address on the internet or through a VPN. If network address translation (NAT) is used the address may be assigned to a router rather than directly to the gateway. This is the same IP address that is then entered in the Server Address field when adding the Server to the eSync application's Server list (see "SmartLink Wireless Monitoring Station installation" on page 8). When installing the SmartLink Wireless software, ensure that the IP address and ports are not blocked by any firewall. Contact your Network Administrator concerning this subject.

The Gateway Client may be installed on multiple computers such the Gateway/Monitoring Station system and any other computers on that have access to the Gateway.

4 Menus, toolbars and screens

Menu tree

The SmartLink Wireless menu tree consists of the following:

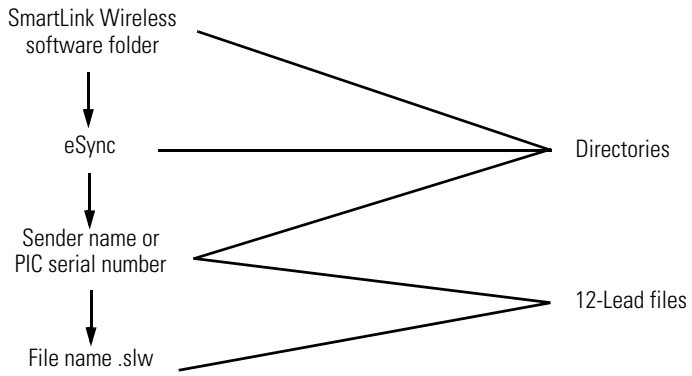


File menu

Open 12-Lead Transmission

The Open 12-Lead Transmission menu option is used to open a previously received SmartLink Wireless data file with the .slw file extension.

The files are stored as shown below:



Exit

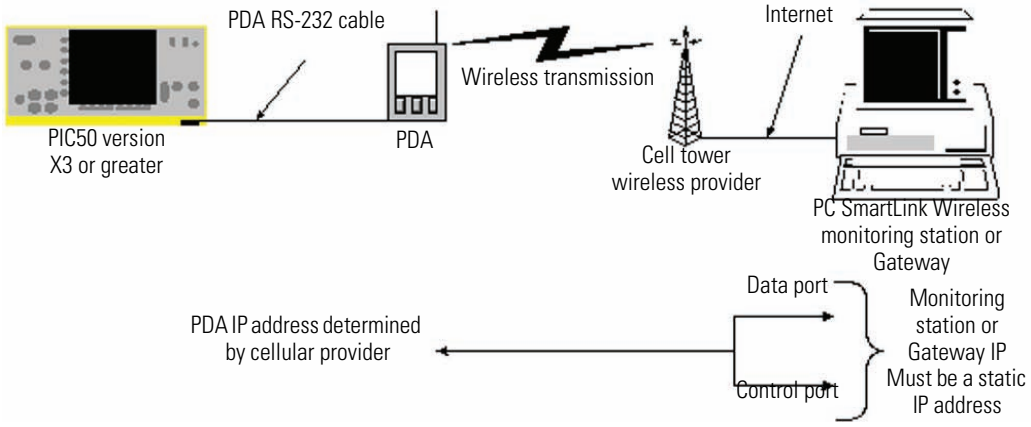
Selecting Exit shuts down the SmartLink Wireless software.

Tools menu

Options

The Options menu item displays the SmartLink Wireless Configuration dialog, from which it is possible to configure mail settings, forwarding options, automation features, sounds, and more.

Figure 5: IP addresses


PDA RS-232 cable
Wireless transmission
Internet
PIC50 version X3 or greater
PDA
Cell tower wireless provider
PC SmartLink Wireless monitoring station or Gateway
Data port
Monitoring station or Gateway IP Must be a static IP address
PDA IP address determined by cellular provider
Control port

As seen in "Figure 5: IP addresses", the SmartLink Wireless software is required to have a fixed IP address assigned to it. Contact your network administrator concerning the assignment of the IP address. Your network administrator should assign the IP port address for the SmartLink Wireless software to ensure that it does not conflict with any

firewall blocking mechanisms. Use the Configure Transmission Settings dialog to enter the assigned port address for the SmartLink Wireless software IP address.

Mail Server

The Mail Server tab is used to configure an outgoing SMTP mail server for use with SmartLink Wireless. Using the appropriate settings for the mail server, provide the server address and port, as well as the user name and password (if required). If the mail server requires authentication, make sure to check the checkbox for "My outgoing mail server requires authentication." The Test Server Settings button is used to send a test mail message to verify that the settings are correct. The "results" dropdown list displays the actual communication with the mail server, for troubleshooting.

Mail Message

The SmartLink Wireless software can be configured to automatically send out e-mail messages when a 12-lead transmission is received by the receiving station. Use the Mail Message tab to configure the contents of the mail message sent. Typically the "Sender Address" will match the "User Name" on the Mail Server tab.

Groups

The Groups tab is used to configure groups for forwarding and paging purposes. A group is defined as one or more recipients to which a given e-mail message, text message and/or numeric page is destined. Enter each group name, one per line, using the Groups tab.

When medics use the PIC50 to send a transmission, they will select from one of 16 Group ID's configured on the PIC50. As the transmission is received, the Group ID will be matched to the list of Groups configured in this list on the monitoring station. When a match is found, that group will be used for any auto-forwarding, text messaging or paging options that have been configured. The match between the PIC50 Group ID and the monitoring station group is not case sensitive.

Note that if a group name is modified, the system will process this as a delete of the old name and an add of a new name. All associations for the old name will be removed, and the new name will have no associations. Also, all PICs will have to be modified to use the new name. As such, the best practice for changing a name is to use the following steps:

1. Add the new group name
2. Copy all associations from the Forwarding, Paging and Text Messaging tabs from the old name to the new name using cut and paste.
3. Start the process of changing all the names on the PICs
4. When all PICs have been modified with the new name, delete the old name.

Since the PICs are most likely distributed throughout the area, the process of modifying the group names on the PICs may require a number of days. This procedure will allow all PICs to continue working properly during the transition. If the affected group list is modified before the transition is complete, be sure to apply the changes to both the old and new groups.

Forwarding

The Forwarding tab is used to configure e-mail addresses of group members. Using the Group dropdown list, select from the configured group names. For each group name, enter one or more e-mail addresses, one per line, in the space below. Repeat this for each group name. To temporarily suspend forwarding the 12-lead to specific email recipients without removing them from the list, place a dash ("-") in front of the addresses. To associate a name with the email address, use the following syntax:

"Name" <address@server.com>

For example:

"Dr. Smith" <drsmith@yahoo.com>

Make sure this syntax will work with the email server before entering all addresses in this format.

Paging

The Paging tab is used to configure numeric pager numbers of group members. Using the Group dropdown list, select from the configured group names. For each group name, enter one or more dialing sequences, one per line, in the space below. This dialing sequence will typically be a phone number followed by a series of characters and numbers for making paging selections and displaying a page message. This sequence will depend on the paging service dialed and the dialing device in use. Most standard modems use a comma for creating a pause, which may be needed as part of the dialing sequence.

Repeat this for each group name. The Dialing Device dropdown list contains one or more detected dialing devices (such as modems) attached to the receiving station. Select the appropriate dialing device to be used to dial numeric pages.

Text Messaging

The Text Messaging tab is used to configure mobile number-based e-mail addresses of group members for SMS text messaging. Using the Group dropdown list, select from the configured group names. For each group name, enter one or more e-mail addresses, one per line, in the space below. Repeat this for each group name. The "New" button provides a facility for converting the mobile number into the appropriate e-mail address based on your wireless provider. Your actual e-mail address may vary based on your mobile carrier. Consult your mobile carrier for specific information and for details on potential costs associated with sending SMS text messages. To temporarily suspend forwarding the 12-lead to specific text message recipients without removing them from the list, place a dash ("-") in front of the addresses. To associate a name with the email address use the following syntax:

"Name" <phonenumber@carrier.com>

For example:

"Dr. Smith" <8471234567@vtext.com>

Make sure this syntax will work with the email server before entering all text message numbers in this format.

TCP/IP

The TCP/IP tab is used to configure the ports used by the SmartLink Wireless software used to communicate with the eSync application. The default port values are 2098 and 2099, but these values may be changed if needed. See "Figure 5: IP addresses" on page 20, and contact your network administrator for more information concerning port configuration.

Sender List

The Sender List dialog is used to assign a "Sender" name to a PIC50 serial number. On receiving a transmission, the Server displays the sender name in the Sender column of the Transmission Event Log. If the SmartLink Wireless software receives a transmission from a PIC50 that is not in the list, the PIC50 serial number will show up in the Sender column of the Transmission Event Log. Note that the sender name is the name of the folder in which 12-Lead Data Files and any corresponding PDF files are archived (see "Open 12-Lead Transmission" on page 20.)

Event Log

The Event Log tab is used to select which columns of the Transmission Event Log window are displayed. By default, all columns are displayed; the "Trns #" column, however, may not be hidden.

Sounds

The Sounds tab is used to configure audible notifications played when 12-lead transmissions are received. A .WAV file can be selected using the Browse button. The frequency selection for the Audio Notification determines the period at which the notification will sound. The audio alarm is turned off automatically at user interaction, such as when the mouse is moved.

Automated Features

The Automated Features tab is used to enable or disable the various actions which can take place automatically when a 12-lead transmission is received. These settings can be used to:

- Automatically open 12-lead snapshots for viewing
- Automatically print 12-lead snapshots to a specified printer
- Automatically create 12-lead PDF files and optionally forward them via email as configured in the Forwarding tab
- Automatically dial pager numbers as configured in the Paging tab
- Automatically send text messages as configured in the Text Messaging tab.

Debug

This tab enables the site to turn on debug logging to assist in diagnosing system problems. By default, debug logging is turned off. To turn it on, check the "Debug On" check box. This will keep one log file for each day containing information about the reception and processing of 12-lead transmissions. This information can be used by the site and Welch Allyn support to detect system failures. Optionally, the log files can be saved on error conditions only. These files will be saved in a sub-folder of the installation

folder. The subfolder will be named "debug." The system will maintain only 20 debug log files in this folder. When more than 20 files are detected, the oldest files will be deleted.

Window menu

Tile

Tiles all open windows.

Cascade

Cascades all open windows.

Help menu

About SmartLink Wireless

Displays a dialog box detailing the version number of the SmartLink Wireless software and copyright information.

Toolbars

Each of the SmartLink Wireless Monitoring Station windows has a toolbar that can be used to execute commands. The tool bar buttons will change based on the window currently displayed.

Main window toolbar buttons

Open 12-Lead

For more details, see "Open 12-Lead Transmission" on page 20.

12-Lead Snapshot window toolbar buttons

Print Preview

Print preview is used to view the 12-Lead data as it will appear when printed. The preview can also be zoomed.

Print

Sends the currently selected 12-lead snapshot to the printer.

Save 12-lead As

This option is used to save the selected open 12-lead file to a different file name or location. When the save is complete, the current 12-lead file will still be displayed.

Close Window

Closes the currently selected 12-lead snapshot window. If an associated print preview window is open for this snapshot, it will also be closed.

Forward 12-Lead

This option can be used to manually forward a PDF of the currently selected 12-lead snapshot to a specified list of email recipients. When the button is clicked, a "Forward 12 Lead" sub-window is opened for the currently selected snapshot.

This window will display the list of the Groups that have been configured in the "Tools | Options" Groups tab. When a group is selected, the Group Members which have been configured in the Forwarding tab for that group will be displayed. To forward the 12-lead to all member of the group, click the "Forward to Group" button or just double click the group. To forward the 12-lead to selected members of the group, select one or more members, and click the "Forward to Member(s)" button or just double click the group member. To select multiple members, press and hold the "Ctrl" button on the keyboard while selecting.

To forward the 12-lead to an email address that has not already been configured in the Forwarding tab, enter that address in the "email Address" text box and click the "Forward to Specified Address" button.

All email addresses selected for forwarding will be listed in the "Forwarding Recipients List." If addresses need to be removed from the list, use the "Remove" button to remove

selected addresses from the list, or the "Clear" button to remove all addresses. When the list contains all the email addresses to which this 12-lead will be forwarded, click the "Send" button. This will start the process of emailing the 12-lead. Monitor the "Forwarding Recipient List" to view the status of the send. When complete, click the "Done" button to close the window, or the "Clear" button to start a new list.

Note If an attempt is made to close the 12-lead snapshot while the send is in progress a warning will be displayed that proceeding to close the window may abort the send.

If the process of sending or building the recipients list is interrupted by the receipt of a new 12-lead transmission, the current state of the 12-lead forwarding will remain for completion after the new 12-lead operation is complete.

Print Preview window toolbar buttons

Zoom

Zoom allows the 12-Lead snapshot print preview to be magnified. The Zoom feature does not change the appearance of the print out.

Print

Sends the previewed 12-Lead snapshot to the printer.

Close Window

Closes the Print Preview window.

Transmission Event Log window

When the SmartLink Wireless software is started, the Transmission Event Log is displayed maximized. Note the Transmission Event Log remains on the screen as long as the Server is running. The log window may be resized or minimized but may not be closed.

The Transmission Event Log provides a detailed listing of 12-Lead transmissions received. When the SmartLink Wireless software receives a valid transmission, it is added to the Transmission Event Log. Depending on the options selected by the user, a sound may be played on the PC running the SmartLink Wireless software and an email, text message and/or page may be sent out automatically by the Server to designated personnel notifying them of a new transmission.

After the transmission is added to the Transmission Event Log, all currently known data about the transmission (such as transmission number, sender name, status of the transmission, current progress, elapsed time of the given transmission, and the date and time the transmission was accepted) are added to the log entry.

Table 1: Transmission Event Log fields

Column	Description
Trns #	Transmission number. A sequential index in time that the transmission was received relative to all transmissions currently existing in the Transmission Event Log. This field is for reference purposes only. If a transmission is deleted from the Log, the transmissions following the deleted transmission are updated -- each transmission number is decremented by one.
Viewed?/First Viewed	Whether the given 12-Lead has been opened/viewed. When a transmission is accepted, the field displays "No." After the transmission is successfully completed and the Transmission is opened for the first time the entry for this field is changed from "No" to "Yes – date / time," indicating the date and time the 12-Lead data was first opened for viewing. Note that only successful, "Complete" 12-Lead transmissions may be viewed. Failed and cancelled transmissions will always display "No."
Sender	Name from the Sender List dialog. See "Sender List" on page 23 for more details.
Status	Indicates the status of a given transmission. Possible values are as follows: • Complete: The transmission was completed successfully. • Failed: The transmission failed prematurely (due to factors such as excessive network traffic, timing out, a dropped connection, etc.) • Re-transmitting: The transmission is not yet complete and the SmartLink Wireless software is attempting to request retransmission of needed data. • Sender Cancelled: The sender explicitly cancelled the transmission via the Welch Allyn PIC50 while the SmartLink Wireless software was waiting for the original transmission to complete. Note that only "Complete" 12-Lead transmissions can be opened and viewed. Also, if a transmission fails or the sender cancels, the Hospital, Acq Date, Acq Time, Patient ID, Patient Name, Unit ID, and Dept fields will remain blank because the transmission data is incomplete.
Progress	Progress of a given transmission in terms of percentage complete.
Transfer Time	Elapsed time for a given transmission. When a 12-Lead transmission is accepted, the Transfer Time column for the log entry begins at "00:00" and increases as data is transferred. When the transmission is complete, the counter for the given transmission is stopped, and the transfer time displayed reflects the amount of time the transmission took from start to finish.
Recv Date	Date a given transmission was accepted by the SmartLink Wireless software.
Recv Time	Time a given transmission was accepted by the SmartLink Wireless software.
Group	The group name/ID selected from the PIC50 device.
Acq Date	Date the patient was created by the Welch Allyn PIC50.
Acq Time	Time the patient was created by the Welch Allyn PIC50.
12-Lead ID	Unique identifier of the transmission.
Patient ID	ID of the patient associated with the 12-Lead data.
Patient Name	Name of the patient associated with the 12-Lead data.
Unit ID/Phone #	Unit ID of the Welch Allyn PIC50 used to acquire the 12-Lead data. This may also be entered as the phone number of the emergency personnel that acquired the 12-lead as a quick reference for the hospital personnel.
Dept	Department assigned to the Welch Allyn PIC50 used to acquire the 12-Lead data.

Clearing Transmission Entries from the Transmission Event Log

Right clicking an entry of the Transmission Event Log displays a pop-up menu with three items "Clear Selected Item," "Clear All Failed and Cancelled Items", and "Clear All Items."

12-Lead Snapshot window

The SmartLink Wireless software allows 12-Lead data, patient information, and analysis results (if available) to be viewed conveniently from one window. A transmission may be opened in one of the following ways:

- Double clicking a successfully completed entry in the Transmission Event Log.
- Pressing the "Open 12-Lead" toolbar button, see "Open 12-Lead Transmission" on page 20 for details.
- Selecting the "File" menu item and then the "Open 12-Lead Transmission," see "Open 12-Lead Transmission" on page 20 for details.
- A new transmission may automatically be opened due to options selected by the user, see "Event Log" on page 23 for details.

When a 12-Lead Snapshot is opened, the left pane of the window displays date and time, patient information, and if available, analysis data and interpretive results. Table 2 lists the information that is displayed.

Table 2: 12-Lead Snapshot fields

Displayed data	Description
ETA	Estimated Time of Arrival supplied by the medic. This is only available if the "Eta/Altitude Entry" option had been turned on when eSync was installed on the PDA.
Altitude	Altitude supplied by the medic. This is only available if the "Eta/Altitude Entry" option had been turned on when eSync was installed on the PDA.
12-Lead ID	Same as "12-Lead ID" on the Transmission Event Log
Patient ID	Same as "Patient ID" on the Transmission Event Log
Name	Same as "Patient Name" on the Transmission Event Log
Date	Same as "Acq Date" on the Transmission Event Log
Time	Same as "Acq Time" on the Transmission Event Log
Age	Patient's Age
Sex	Patient's Sex
S/N	PIC50 Serial Number
Dept	Same as "Dept" on the Transmission Event Log
Unit/Phone #	Same as "Unit ID" on the Transmission Event Log
Group	The Group ID selected on the PIC50 when the 12-lead was transmitted to the monitoring station.
Heart Rate	As measured by the PIC50 when the snapshot was taken. This is only available if an automatic or manual analysis of the snapshot was performed on the PIC50.
PR Interval	As measured by the PIC50 when the snapshot was taken. This is only available if an automatic or manual analysis of the snapshot was performed on the PIC50.
QRS Duration	As measured by the PIC50 when the snapshot was taken. This is only available if an automatic or manual analysis of the snapshot was performed on the PIC50.
QTC Interval	As measured by the PIC50 when the snapshot was taken. This is only available if an automatic or manual analysis of the snapshot was performed on the PIC50.
P Axis	As measured by the PIC50 when the snapshot was taken. This is only available if an automatic or manual analysis of the snapshot was performed on the PIC50.
QRS Axis	As measured by the PIC50 when the snapshot was taken. This is only available if an automatic or manual analysis of the snapshot was performed on the PIC50.
T Axis	As measured by the PIC50 when the snapshot was taken. This is only available if an automatic or manual analysis of the snapshot was performed on the PIC50.
Analysis	Analysis from the PIC50 if an automatic or manual analysis of the snapshot was performed on the PIC50.

The major portion of the window displays the 12-Lead snapshot of ECG waveform data, in the conventional 4x3 layout, in which each 12-Lead is a 2.5-second strip, and a full 10-second strip of lead II below it. Using the horizontal scroll bar on the 12-Lead Snapshot window it is possible to pan across all available ECG waveform data for a complete review.

Note The SmartLink Wireless software allows the user to open multiple 12-Lead Snapshot windows simultaneously for ease of comparison and viewing.

5 eSync Application

The Welch Allyn eSync application runs on a handheld computer. To receive data from a PIC50 device the handheld must be connected via serial cable to the PIC50. When a transmission is sent from a PIC50 device, the eSync application receives the transmission and sends it wirelessly over the Internet to the SmartLink Wireless software running on a PC.

Note The blue, underlined text links may be clicked to obtain help or information on a topic or feature of the eSync application.

eSync Application menus, toolbars and screens

Tools menu

When transmitting 12-lead data from a PIC50 using the eSync software on a PDA, the best practice is to first power on the PIC50, then connect the PDA to the PIC50 using the serial cable before starting the eSync software. This enables the software to detect the presence of the COM1 serial port on the PDA. In some case, if the COM1 port cannot be detected or another port has been configured for use, the next available port (typically COM2) may be initialized. This may result in some PDAs not being able to establish a cellular internet connection, or in the loss of an existing connection.

Serial Port settings

This dialog allows the user to select a serial port for communicating with the PIC50. The dialog displays a combo box labeled Serial Port with a drop down list of available serial ports. The user may click on the combo box arrow to see the list of available serial ports to select any port from the list. To enable the PDA to detect the presence of the COM1 serial port, the best practice is to connect the serial cable to the PIC before starting the eSync software and attempting to configure the serial port.

This dialog also allows the user to select a baud rate for communicating with the PIC50. The dialog displays a Baud Rate combo box with a drop down list of available baud rates. The user may click on the arrow to see the list of available baud rates and select any baud rate from the list.

The Refresh button updates the list of currently available serial ports and baud rates.

Unless directed otherwise by Welch Allyn SmartLink Wireless support, the serial port settings should always be configured to use Serial Port COM1 and a Baud Rate of 57600.

Server Configuration

The Server Configuration dialog allows the user to add, delete, and update SmartLink Wireless servers to which the eSync application may send out transmissions. The dialog also offers the option to automatically connect to the Internet on application startup.

Add, Delete, and Update:

The Server Configuration dialog provides the user the capability to build a list of SmartLink Wireless servers. A maximum of thirty-two Servers may be added to the list. The user may add a new Server by entering Server Name, Server Address, Data Port, and Control Port in the appropriate edit boxes. See "SmartLink Wireless Monitoring Station installation" on page 8 for details on the data to enter in the edit boxes. Upon entering all the information, the user may press the Add button to add the new Server to the list.

Even if the Server list is created first on the PC, the user may later further modify the list at the handheld by using the Server Configuration dialog.

The user may press the Delete button to delete a selected Server from the list.

The user may update a Server by selecting the Server on the list, editing its fields using the combo boxes, and pressing the Update button.

Auto Connect on Startup:

When this option is checked the eSync application will automatically try to establish an Internet connection on startup. Otherwise an Internet connection must be established manually prior to sending 12-Lead data to SmartLink Wireless software.

Test SmartLink Wireless software

The dialog displays a list of the SmartLink Wireless servers that are available. The user may select any Server on the list and press the Begin Transmission button to send a 'test' transmission to the Server. A message is displayed to the user notifying success or failure of the test. In case of failure, the reason for failure is indicated.

Help menu

About Welch Allyn eSync

Displays a dialog box detailing the version number of the product and copyright information.

eSync application states

When not transmitting data, the eSync application monitors the serial port for incoming data from a PIC50. The main screen of the eSync application displays:

Initializing (and shows the selected serial port and baud rate)

Waiting for device transmission...

As the eSync application starts receiving data from PIC50 it indicates to the user it is processing data:

Processing incoming data...

At this stage, if the eSync application does not receive data from the PIC50 for two seconds, it terminates the transmission and goes back to the state waiting for device transmission.

When all data for a particular transmission has been received from PIC50, the eSync application displays its list of Servers and prompts the user to select a Server from the list.

Note that if there is only one Server, the eSync application does not display the Server list to the user. The eSync application automatically sends out the transmission to the Server without waiting for any user interaction.

After the user selects a Server from the list and presses the Begin Transmission button, the main screen of the eSync Application indicates the following stages:

Connecting to 12-Lead Server...

Transmitting data to 12-Lead Server...

Waiting for delivery confirmation...

If the eSync application is unable to connect to the selected Server, it displays a message to the user and indicates a reason for not being able to connect. At this point, the user is given the choice to press the Cancel button to abort the transmission or he may press OK, located at the top left corner of the screen, to continue trying to establish a connection with the Server.

On successfully sending out the transmission to the Server, the eSync application displays a success message and goes back to the state waiting for device transmission.

If the transmission to the Server fails, the eSync application displays a failure message and indicates a reason for the failure. A transmission may fail for several reasons, such as, inability to connect to the Internet, incorrect Server configuration (e.g. wrong IP address), Server not up and running, etc.

A Appendix

Naming convention for 12-Lead Data Files

When the SmartLink Wireless Monitoring Station receives a transmission from a Sending Station, the associated 12-Lead Data File is automatically saved on the PC running the monitoring station. The file is saved under the directory where the SmartLink Wireless software is installed. If the original 12-Lead Data File is removed or renamed the file cannot be opened from the Transmission Event Log by double clicking the log entry. The file may still be opened by using the File | Open 12-Lead Transmission (section 5.1.1) menu item or the Open 12-Lead toolbar button (section 5.5.1). Note that when a transmission is cleared from the Transmission Event Log, the file corresponding to the transmission does not get deleted. The file remains in its original location and may be viewed by opening the file from the File | Open 12-Lead Transmission menu item or the Open 12-Lead toolbar button. The file may also be opened by simply double clicking the filename on the Windows Explorer.

Figure 6: 12-Lead Data File name composition

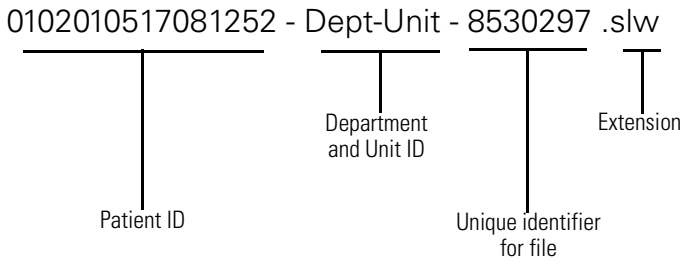


Figure 6 details the individual components that make up the 12-Lead Data File name. The Date, Time, and Serial Number combination constitute the "Patient ID" on the Transmission Event Log. The unique identifier is used in case the same 12-Lead Data File is sent twice; it is derived from a running clock contained within the Windows environment.

Glossary

The following definitions, acronyms and abbreviations are defined for the purpose of this document.

12-Lead Data File A binary file corresponding to a transmission. Contains 12-Lead data, and analysis results if available. Has a file extension type "slw"

CDMA Code Division Multiple Access

DMZ "Demilitarized Zone", a part of a site's network configuration which has direct exposure to the Internet and buffers access from the Internet to the internal local area network.

ED Emergency Department

eSync application Same as SmartLink Wireless eSync

Gateway Welch Allyn SmartLink Wireless Gateway Service

Gateway Client Welch Allyn SmartLink Wireless Gateway Client

Monitoring Station Physical location of the SmartLink Wireless Monitoring Station software

PHI Protected Health Information

PIC50 Portable Intensive Care, Multi Parameter Monitor/Defibrillator

RS-232 A serial communication protocol

Sending Station Physical location where patient 12-Lead data and optional analysis results are acquired using a Welch Allyn PIC50

SmartLink Wireless Welch Allyn SmartLink Wireless System

SmartLink Wireless eSync application The part of Welch Allyn SmartLink Wireless System that runs on a handheld computer

SmartLink Wireless software The various components of the Welch Allyn SmartLink Wireless System that run on a PC